

Claims:

1. A solder joint between a solder and a conductor terminal formed on a wiring structure, comprising:

a nickel layer formed by nickel-phosphorus electroless plating on the conductor terminal;

5 an intermetallic compound layer formed on the nickel layer, the intermetallic compound layer including tin (Sn), copper (Cu), and nickel (Ni); and

a solder layer formed on the intermetallic compound layer, the solder layer including tin (Sn), silver (Ag), and copper
10 (Cu).

2. The solder joint according to claim 1, wherein the intermetallic compound is composed mainly of tin (Sn) and copper (Cu).

3. The solder joint according to claim 1, wherein the
15 intermetallic compound layer has cauliflower-shaped surfaces formed in a solder-layer's side thereof.

4. The solder joint according to claim 1, wherein the conductor terminal is composed mainly of copper.

5. A solder joint between a solder and a conductor

terminal formed on a wiring structure, comprising:

 a nickel layer formed by nickel-phosphorus
electroless plating on the conductor terminal;
 an intermetallic compound layer formed on the nickel
5 layer; and
 a solder layer formed on the intermetallic compound
layer,
 wherein the intermetallic compound layer has
cauliflower-shaped surfaces formed in a solder-layer's side
10 thereof.

6. The solder joint according to claim 5, wherein the
conductor terminal is composed mainly of copper.

7. A wiring structure having a plurality of conductor
terminals formed thereon, each of which is soldered to form a solder
15 joint, the solder joint comprising:

 a nickel layer formed by nickel-phosphorus
electroless plating on the conductor terminal;
 an intermetallic compound layer formed on the nickel
layer, the intermetallic compound layer including tin (Sn), copper
20 (Cu), and nickel (Ni); and
 a solder layer formed on the intermetallic compound
layer, the solder layer including tin (Sn), silver (Ag), and copper
(Cu).

8. The wiring structure according to claim 7, wherein the intermetallic compound layer has cauliflower-shaped surfaces formed in a solder-layer's side thereof.

9. A wiring structure having a plurality of conductor
5 terminals formed thereon, each of which is soldered to form a solder joint, the solder joint comprising:

a nickel layer formed by nickel-phosphorus
electroless plating on the conductor terminal;

an intermetallic compound layer formed on the nickel
10 layer; and

a solder layer formed on the intermetallic compound
layer,

wherein the intermetallic compound layer has
cauliflower-shaped surfaces formed in a solder-layer's side
15 thereof.

10. A device comprising:

a wiring substrate having a plurality of substrate
terminals formed thereon; and

a functional circuit having a plurality of circuit
20 terminals, wherein the substrate terminals are soldered to
respective ones of the circuit terminals at solder joints,

wherein each of the solder joints comprises:

a nickel layer formed by nickel-phosphorus electroless
plating on the conductor terminal;

an intermetallic compound layer formed on the nickel layer,
the intermetallic compound layer including tin (Sn), copper
(Cu), and nickel (Ni); and

5 a solder layer formed on the intermetallic compound layer,
the solder layer including tin (Sn), silver (Ag), and copper (Cu).

11. The device according to claim 10, wherein the
intermetallic compound layer has cauliflower-shaped surfaces
formed in a solder-layer's side thereof.

12. A device comprising:
10 a wiring substrate having a plurality of substrate
terminals formed thereon; and

a functional circuit having a plurality of circuit
terminals, wherein the substrate terminals are electrically
connected to respective ones of the circuit terminals at solder
15 joints,

wherein each of the solder joints comprises:

a nickel layer formed by nickel-phosphorus electroless
plating on the conductor terminal;

an intermetallic compound layer formed on the nickel layer;
20 and

a solder layer formed on the intermetallic compound layer,

wherein the intermetallic compound layer has
cauliflower-shaped surfaces formed in a solder-layer's side
thereof.

13. A device comprising:

a printed circuit substrate having a plurality of substrate terminals formed thereon; and

a semiconductor chip package having a plurality of package terminals, wherein the substrate terminals are soldered to respective ones of the package terminals at solder joints, wherein each of the solder joints comprises:

a nickel layer formed by nickel-phosphorus electroless plating on each of a corresponding substrate terminal and a corresponding package terminal;

an intermetallic compound layer formed on the nickel layer, the intermetallic compound layer including tin (Sn), copper (Cu), and nickel (Ni); and

a solder layer formed on the intermetallic compound layer, the solder layer including tin (Sn), silver (Ag), and copper (Cu).

14. The device according to claim 13, wherein the intermetallic compound layer has cauliflower-shaped surfaces formed in a solder-layer's side thereof.

15. A device comprising:

a printed circuit substrate having a plurality of substrate terminals formed thereon; and

a semiconductor chip package having a plurality of package terminals, wherein the substrate terminals are soldered

to respective ones of the package terminals at solder joints,

wherein each of the solder joints comprises:

a nickel layer formed by nickel-phosphorus electroless plating on each of a corresponding substrate terminal and a

5 corresponding package terminal;

an intermetallic compound layer formed on the nickel layer;

and

a solder layer formed on the intermetallic compound layer,

wherein the intermetallic compound layer has
10 cauliflower-shaped surfaces formed in a solder-layer's side
thereof.